Rhetoric as Knowledge

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A proper assessment of the relation between discourse structure and speaker's communicative intentions requires a better understanding of communicative intentions. This contribution proposes that there is a crucial difference between intending the hearer to entertain a certain belief (or desire, or intention), and intending to affect the strength with which the hearer entertains the belief (or desire, or intention). Rhetoric, if defined as a body of knowledge about how discourse structure affects the strength with which a discourse participant entertains beliefs, desires, and intentions, can be seen to play a precise and crucial role in the planning of discourse.

1 Communicative Intentions

It is commonly assumed that in engaging in communication, the speaker[1] (S) has a specific communicative intention. Communicative intentions relate to that domain that the use of language can affect, namely the mental state of the hearer (H), i.e., H's beliefs, desires, and intentions. Of course, S may have other intentions that relate to the world at large (such as to get H to open a window), but these are not properly speaking communicative intentions: they can only be achieved by use of language if language first produces some appropriate change in H's mental states.

In discussing the ways in which S's use of language can affect H's mental states, it is important to make a distinction between the fact that H is entertaining a belief, desire, or intention, and the degree or strength with which it is entertained. This distinction has not always been made in the text generation literature; presumably, this is because for the types of texts whose generation has been studied, namely reports, documentation, and manuals of various kinds, this distinction is not relevant. This is because these texts (weather reports, military reports, instruction manuals, and so on) are "authoritative texts": if the text makes H entertain a certain belief or intention, then H will do so with a sufficient strength to satisfy S's communicative goals.

I claim that the interesting aspects of rhetorical relations (or "rhetoric" for short), and the intersting role that rhetoric can play in discourse generation, have not been studied because the types of text analyzed and generated have been one-sided in significant respects. For the sake of concreteness, let us assume the following definition:

[1] I use the terminology from spoken language; these remarks apply equally well to written language.

1. REPORT DATE **1993**	2. REPORT TYPE	3. DATES COVERED **00-00-1993 to 00-00-1993**
4. TITLE AND SUBTITLE **Rhetoric as Knowledge**		5a. CONTRACT NUMBER
		5b. GRANT NUMBER
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)		5d. PROJECT NUMBER
		5e. TASK NUMBER
		5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Department of Computer and Information Sciences,University of Pennsylvania,Philadelphia,PA,19104**		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION/AVAILABILITY STATEMENT **Approved for public release; distribution unlimited**		
13. SUPPLEMENTARY NOTES		
14. ABSTRACT		
15. SUBJECT TERMS		

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES **4**	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**			

Rhetoric is S's knowledge of how text structure manipulates the strength of beliefs, desires, and intentions already entertained by H.

In order to argue that this definition makes sense, I will discuss three questions: is rhetoric necessary, is it trivial, and is it useful?

2   Is Rhetoric Necessary?

More precisely, I will discuss whether S must *necessarily* have access to rhetoric in order to communicate effectively. S can only affect H's mental state through the use of a text (the sequence of utterances which constitute an act of communication), which means that it is in the act of decoding the text that H is affected. Thus S's goal is that H be affected *by the text*. In order to achieve this goal, S must know about the process of decoding that H will use, otherwise S cannot purposefully use language. Does text structure contribute to affecting H? Consider the following discourses (uttered in a context where S knows that H does not like paying taxes under any circumstance).

(1) Vote for Bush. Clinton will raise taxes. Bush will not raise taxes.

(2) Clinton will raise taxes. Vote for Bush. Bush will not raise taxes.

(2) is arguably less convincing than (1) since the the two sentences about the candidates' attitude towards taxation are not juxtaposed, thus depriving them of their contrastive force. Since text structure participates in affecting H, then S must have knowledge about the mechanism; i.e., S must have access to rhetoric.

3   Is Rhetoric Trivial?

It has often been observed that many of the definitions of rhetorical relations are tautologous. Consider, for example, RST's definition of EVIDENCE [Mann and Thompson, 1987, p.10]. 'Nuc' refers to the nucleus, that for which evidence is being contributed, and 'Sat' refers to the satellite, the evidence. Nuc and Sat are assumed to be juxtaposed.

relation name:	EVIDENCE
constraints on N:	H might not believe Nuc to a degree satisfactory to S
constraints on S:	The reader believes Sat or will find Sat credible.
constraints on the N+S combination:	H's comprehending Sat increases H's belief of Nuc
the effect:	H's belief of Nuc is increased

The effect is a mere restatement of the constraint on the combination of Nuc and Sat – the definition of the relation does not seem to be very informative. But consider a possible discourse relation COUNTER-EVIDENCE:

relation name:	COUNTER-EVIDENCE
constraints on N:	H might believe Nuc more strongly than S intends H to
constraints on S:	The reader believes Sat or will find Sat credible.
constraints on the	
N+S combination:	H's comprehending Sat decreases H's belief of Nuc
the effect:	H's belief of Nuc is decreased

The definition of COUNTER-EVIDENCE is entirely similar to (and as tautologous as) that of EV-IDENCE, but it does not yield a coherent discourse. Consider the following, uttered in the same context as (1) and (2) above:

(3) Clinton will lower taxes. No democratic president has ever lowered taxes.

There is no coherent reading for (3) under which S wants to decrease H's belief in the first sentence. In order to achieve this effect, S needs to explicitly negate the first clause, which results in an EVIDENCE relation.

(4) Clinton will not lower taxes. No democratic president has ever lowered taxes.

Thus, the contribution of rhetoric lies in detailing what sort of effects (on H's beliefs, desire, and intentions) mere juxtaposition can achieve. The fact that not all possible effects can be achieved without explicit lexical and syntactic means is what makes rhetoric an important body of knowledge in discourse processing.

4 Is Rhetoric Useful?

More specifically, can rhetoric be used in discourse planning? From what has been said, it would follow that rhetoric is essential in discourse planning, since without rhetoric, S would have no knowledge of the effects of the discourse structure on H. But can rhetoric, as defined here, in fact be used for discourse planning? Text planning architectures using knowledge about the relationship between communicative intentions and the juxtaposition of discourse segments have been developed at ISI [Hovy, 1988]. I conjecture that this type of architecture is well suited for planning texts (or those aspects of texts) that manipulate the strength with which H entertains beliefs, desires, and intentions. Such a planner would require a more sophisticated representation of mental states:

1. A logic of desire and a logic of intentions are required. The logic of desire would most likely be a modal logic; the logic of intentions would, presumably, require a representation of action.

2. For beliefs, desires, and intentions, the strength with which they are entertained must also be represented. Strength can be represented by discrete indications of quality, as has been done by [Walker, 1993] in conversational models.

Ideal applications of such a planner would include texts whose primary goal is to increase H's desire to perform a certain action, such as advertising texts of the types given above. Furthermore, dialog

planning is more likely to yield interesting instances of the use of rhetoric, since in monologic genres the modeling of the strength of H's beliefs, desires, and intentions must remain conjectural, while in dialogic genres, H's feedback can contribute to S's assessment of H's mental state.

Rhetoric is not useful for texts whose goal is mainly or exclusively to convey information, and for which H is assumed to *strongly* believe any proposition the text makes H entertain. This is typically the case for reports, including those generated by the original ISI planner. The use of a rhetoric-based top-down planner for planning such texts cannot be successful [Kittredge et al., 1991], since here the decomposition of the communicative goal must refer to the domain structure, and therefore is too unconstrained to be handled by a domain-independent body of knowledge.

5 Types of Intentions, Types of Relations, Types of Texts

The distinction that has been made throughout this paper, between making H entertain a belief, desire, or intention, and increasing the strength with which it is entertained, corresponds to the one between intentional/presentational and informational/subject matter relations made by [Mann and Thompson, 1987], and recently discussed by [Moore and Pollack, 1992]. Rhetoric relates to the intentional level – note that the effect of RST's presentational relations are all formulated in terms of increasing the strength of some aspect of H's mental state, while the subject matter relations all have the effect of making H entertain ("recognize") new beliefs. Texts that do not have a meaningful intentional level, such as reports, cannot be planned using a rhetoric-based planner. Texts that only have an intentional level of structure, such as (1) above, are ideally suited for such planners. However, as Moore and Pollack argue, many texts simultaneously have both types of structure. For such texts, new planning architectures must be found. They will require a better understanding of communicative goals along the lines argued for in this paper.

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